COMMONWEALTH OF VIRGINIA
Department of Environmental Quality
Piedmont Regional Office

STATEMENT OF LEGAL AND FACTUAL BASIS

Dominion – Northern Neck CT station
Route 697
Warsaw, Richmond County, Virginia
Permit No. PRO40198

Title V of the 1990 Clean Air Act Amendments required each state to develop a permit program to ensure that certain facilities have federal Air Pollution Operating Permits, called Title V Operating Permits. As required by 40 CFR Part 70 and 9 VAC 5 Chapter 80, Dominion Resources, Inc. d/b/a Virginia Electric & Power Company has applied for a Title V Operating Permit for its Dominion – Northern Neck Combustion Turbine Station, Route 697, Warsaw, VA. The Department has reviewed the application and has prepared a Title V Operating Permit.

Engineer/Permit Contact:_____ Date:_____

Air Permit Manager:_____ Date:_____

Deputy Regional Director:_____ Date:_____

FACILITY INFORMATION

Permittee
Virginia Electric and Power Company
5000 Dominion Boulevard
Glen Allen, Virginia 23060

Facility
Dominion - Northern Neck CT Station
Route 697
Warsaw, Virginia

County Plant ID Number: 159-0011

SOURCE DESCRIPTION

NAICS Code: 221112 – Electric Power Generation

Northern Neck Turbine Station is an electric power generation facility. No. 2 Fuel Oil is used to fire Four (4) General Electric Model PB5221 gas turbines each rated at 338 x 10^6 Btu per hour. One of the turbines is equipped with a diesel starter engine for blackstart capacity. The turbines were originally installed in 1971 and are currently being used during periods of peak power production.

The facility is a Title V major source of SO2 and NOx pollutants. This source is located in an attainment area for all pollutants, and is a major source under PSD regulations. The facility was previously permitted under an Exclusionary General Permit, issued March 12, 1998. This permit has been superseded by the Title V permit that was issued on March 18, 2003. The Title V permit was amended on February 13, 2006. The facility submitted an application for the renewal of the Title V permit on August 22, 2007 and the application was received by DEQ on August 28, 2007. There are no other operation or construction permits for this source.

COMPLIANCE STATUS

The facility undergoes a full compliance evaluation on an annual basis. A full compliance evaluation of this facility, including a site visit, was conducted on August 3, 2007. In addition, all reports and other data required by permit conditions or regulations, which are submitted to DEQ, are evaluated for compliance. Based on these compliance evaluations, the facility has not been found to be in violation of any state or federal applicable requirements at this time.

EMISSION UNIT AND CONTROL DEVICE IDENTIFICATION

The emissions units at this facility consist of the following:

Emission Unit No.	Stack No.	Emission Unit Description	Manufacturer and Date of Construction	Size/Rated Capacity	Size/Rated Capacity
ES-1	EP-1	Unit 1 Combustion Turbine	General Electric - PB 5221 July 1971	338 MMBTU/hr. nominal	20.7 Megawatts
ES-2	EP-2	Unit 2 Combustion Turbine	General Electric - PB 5221 July 1971	338 MMBTU/hr. nominal	20.7 Megawatts
ES-3	EP-3	Unit 3 Combustion Turbine	General Electric - PB 5221 July 1971	338 MMBTU/hr. nominal	20.7 Megawatts
ES-4	EP-4	Unit 4 Combustion Turbine	General Electric - PB 5221 July 1971	338 MMBTU/hr. nominal	20.7 Megawatts
ES-5	ES-5	Unit 1 Blackstart Engine	Industrial Application Model V785 July 1971	6.72 MMBTU/hr.	1.97 megawatts

EMISSIONS INVENTORY

A copy of the 2007 annual emission update is attached as Attachment A. Emissions are summarized in the following tables.

2007 Actual Emissions

	Criteria Pollutant Emission in Tons/Year				
Emission Unit	VOC	CO	SO_2	PM-10	NO_x
ES-1	0.00	0.01	0.78	0.05	3.37
ES-2	0.00	0.01	0.74	0.04	3.21
ES-3	0.00	0.01	0.70	0.04	3.05
ES-4	0.00	0.01	0.63	0.04	2.75
ES-5	0.00	0.00	0.00	0.00	0.01
Total	0.00	0.04	2.85	0.17	12.39

No significant Hazardous Air Pollutant Emissions

EMISSION UNIT APPLICABLE REQUIREMENTS

Limitations

The following Virginia Administrative Codes have specific emission requirements that have been determined to be applicable to the facility:

9 VAC 5 Chapter 20 General Provisions

9 VAC 5 Chapter 40 Existing Stationary Sources

Article 1 (Rule 4-1) Visible Emissions and Fugitive Dust/Emissions. This standard is applied to each of the four (4) turbines, reference numbers ES-1, 2, 3 & 4 as well as the Blackstart engine, reference number ES-5.

9 VAC 5-40-940
Unless specified otherwise in this part, no owner or other person shall cause or permit to be discharged into the atmosphere from any affected facility any visible emissions which exhibit greater than 20% opacity, except for one six-minute period in any one hour of not more than 60% opacity. Failure to meet the requirements of this section because of the presence of water vapor shall not be a violation of this section.

Article 8 (Rule 4-8) Emission Standards for Fuel Burning Equipment. This standard is applied to each of the four (4) turbines, reference numbers ES-1, 2, 3 & 4. This standard also is applied to the Blackstart engine, reference number ES-5.

9 VAC 5-40-900(A)(1)

Particulate matter emissions from the operation of each of the four (4) simple cycle combustion turbines (ES-1, 2, 3, & 4) shall each be controlled by good combustion and operating practices. Each turbine has an emission rate that has been reported to be 0.012 lb/MMBtu or 4.06 lb/hr (AP-42 Table 3.1.-2a). These values were obtained from the permit application (potential to emit calculations). The calculations were checked and values are correct as submitted they also met the standard of 0.241 lb/MMBtu input.

Sample calculation: emission factor = 0.012 lb/MMBtu
Annual Heat Input = 2,960,880 MMBtu/year
Annual PM total emissions = 0.012*2,960,880 = 35,530 lb/yr or 17.7 tpy
Hourly PM total emissions = 35,530/8760 = 4.06 lb/hr

The emissions standard for each simple cycle combustion turbine, as defined by Rule 4-8, are defined by the following equation:

PM total = 1.0906(H) ^ -0.2594
H = total heat capacity in MMBtu/hr = 338 MMbtu/hr
PM total = 1.0906(338) ^ -0.2594
PM total = 0.241 pounds of particulate per MMbtu/hr or 81.5 lb/hr.

Potential emissions are therefore much lower than allowable. Consequently visible emissions checks and records of fuel consumption are considered adequate to assure compliance with the PM total limit for the turbines.

Particulate matter emissions from the operation of the blackstart engine have been reported to be 0.31 lb/MMBtu or 14.19 lb/hr. These values were obtained from the permit application (potential to emit calculations). The calculations were checked and values are correct as submitted and met the standard of 0.665 lb/MMBtu input.

Sample calculation: emission factor = 0.31 lb/MMBtu
Annual Heat Input = 204 MBtu/year
Annual PM total emissions = 0.31*204,000 = 63 lb/yr or 0.03 tpy
Hourly PM total emissions = 63/30.4 = 2.08 lb/hr *(the engine has been estimated to run no more than 30.4 hours per year)*

The emissions standard for the blackstart engine are defined by the following equation:

PM total = 1.0906(H) ^ -0.2594
H = total heat capacity in MMBtu/hr = 6.72 MMbtu/hr
PM total = 1.0906(6.72) ^ -0.2594
PM total = 0.665 pounds of particulate per MMbtu/hr

Potential emissions are therefore much lower than allowable. Consequently visible emissions checks and records of fuel consumption are considered adequate to assure compliance with the PM total limit for the blackstart engine.

An October 20, 2005 letter from Dominion requested that the black start engine be listed as an insignificant emission unit and that all permit requirements be removed as they relate to the engine. 9 VAC 5-80-720B.1 states that an insignificant unit must emit less than 5 tons/year of PM10 uncontrolled. However, the definition for “uncontrolled” in 9 VAC 5-80-710.B states that uncontrolled is 8760 hours per year. At this rate, the black start engine would emit 9.12 tons/year. Furthermore, the black start engine is listed at 6.7 MMbtu/hr and 9 VAC 5-80-720.C.2.b states that an insignificant unit must be rated less than 1 MMbtu/hr using distillate oil. Therefore, the request by Dominion was not honored.

Sample calculation: emission factor = 0.31 lb/MMBtu (from above)
0.31 lb PM10/MMbtu x 6.72 MMBtu/hr x 8760 hrs/yr x .0005 ton/lb = 9.12 tons/year

9 VAC 5-40-930(A)(1)

The sulfur content of the fuel oil that has historically been burned in the simple cycle combustion turbine (CT) has been 0.20 weight percent per shipment. Each simple cycle turbine has an emission rate which has been reported as 68.3 lbs/hr. This value was obtained from the permit application (potential to emit calculations). The emission calculations were checked and values are correct as submitted and met the standard of 892.3 pound per hour.

Sample calculations: emission factor = 1.01(S) lb/MMBtu S=0.2
Annual Heat Input = 2,960,880 MMBtu/year

Annual SO2 emissions = 1.01*0.2*2,960,880 = 598,098 lb/yr or 299 tpy
Hourly SO2 emissions = 598,098/8760 = 68.3 lb/hr

The fuel oil referenced in the permit application is No. 2 distillate oil, the heat content of the fuel, as reported in the permit application is 140,000 Btu/gal. The heat content of 140,000 Btu/gal is to be used for determining the facilities compliance status.

The emissions standard for each simple cycle combustion turbine are defined by the following equation:

Hourly SO2 emissions = 2.64*K
Hourly SO2 emissions = 2.64*6.72
Hourly SO2 emissions = 17.74 pounds per hour

The only fuel referenced in the permit application is No. 2 distillate oil, for this reason the permit limits the Blackstart engine to using only No. 2 distillate oil. The heat content of the fuel, as reported in the permit application is 140,000 Btu/gal. The heat content of 140,000 Btu/gal is to be used for determining the facilities compliance status.

9 VAC 5 Chapter 80 PERMITS FOR STATIONARY SOURCES.

Article 1 (Rule 8-5) Federal Operating Permits for Stationary Sources. This standard applies to the entire facility.

Article 2 (Rule 8-6) Permit Program Fees for Stationary Sources. This standard applies to the entire facility.

Monitoring

The monitoring requirements that have been developed to meet Part 70 requirements.

The permittee will monitor and record the fuel usage at the facility to demonstrate compliance with the criteria pollutant and visible emission limitations. Criteria pollutant and visible emission limit violations should not occur from the use of permitted fuels (number 2 distillate oil).

The permittee shall perform quarterly opacity monitoring on each emission unit. The monitoring is composed of quarterly observations using method 22 based techniques on each emission unit with follow-up method 9 should an observation indicate an extended exceedance.

Monitoring and Recordkeeping

The permit includes requirements for maintaining records of all monitoring and testing required by the permit. These records include:

- The following language was added to the permit which has been used at other stations, most notably, the Darbytown facility (50997).
  "The permittee shall test the distillate oil in the distillate oil storage tank (NN-Tank A) for sulfur content after each shipment of distillate oil. Dominion defines a shipment as a series of truck transport loads from any source or other vendor. Distillate oil sulfur content shall be determined using ASTM D2880-78 or another approved ASTM method incorporated in 40 CFR 60 by reference. Records of distillate oil sulfur content shall be available on site for inspection by DEQ personnel. Theses records shall be kept on file for the most current five-year period"

- The VEO schedule was amended to be similar to other permits

  - At least one VEO shall be conducted on each unit that operates for a cumulative total of 20 hours or more during the calendar year.
  - At least one VEO shall be performed during each 200 hours of unit operation during the calendar year.
  - At least one VEO shall be performed during any unit operability verification testing conducted during the calendar year.
  - Each VEO shall be performed for a sufficient period of time to identify the presence of visible emissions. If no visible emissions are observed, no action shall be required. However, if visible emissions are observed, a visible emissions evaluation (VEE) shall be conducted using 40 CFR Part 60, Appendix A, Method 9 for a period of not less than 6-minutes. If the average opacity exceeds 20%, modifications and/or repairs shall be performed to correct the problem and the corrective measures shall be recorded. If such corrective action fails to remedy the opacity problem, a VEE in accordance with 40 CFR Part 60, Appendix A, Method 9, shall be performed for a period of at least 18 minutes to determine compliance with the opacity limits specified in Condition III. B. 2 of this permit. The VEE observer shall be currently Method 9 certified.

- All scheduled and unscheduled maintenance.

- All operating parameters required to demonstrate compliance

  - Distillate oil sulfur content test results (NN Tank A). (This is new as of this permit since the fuel testing requirements changed).

  - Date, time, name of emission unit, applicable visible emissions requirement, results of observation, and name of the observer for each visible emissions evaluation.

- All emissions data

Testing

The permit does not require source tests. A table of test methods has been removed and replaced with the statement, "If testing is conducted in addition to the monitoring specified in this permit, the permittee shall use the appropriate test method(s) in accordance with procedures

approved by the DEQ. The Department and EPA have authority to require testing not included in this permit if necessary to determine compliance with an emission limit or standard.

Reporting

None

GENERAL CONDITIONS

The permit contains general conditions required by 40 CFR Part 70 and 9 VAC 5-80-110, that apply to all Federal-operating permit sources. These include requirements for submitting semi-annual monitoring reports and an annual compliance certification report. The permit also requires notification of deviations from permit requirements or any excess emissions, including those caused by upset, within one business day.

STATE ONLY APPLICABLE REQUIREMENTS

The Virginia Administrative Codes does not have specific requirements only enforceable by the State that is applicable to the applicant:

FUTURE APPLICABLE REQUIREMENTS

There are no future applicable requirements at this time

INAPPLICABLE REQUIREMENTS

The Compliance Assurance Monitoring Rule, (CAM), 40 CFR 64.2, requires owners to monitor the operation and maintenance of the control equipment so they can report if they meet their emission standards. The CAM rule applies to emission units at a major source that are required to obtain a Title V permit, if all of the following criteria are met: (1) the unit is subject to an emission limit or standard for a regulated pollutant, (2) the unit uses a control device to achieve compliance with an emission limit and (3) the unit has potential to emit major source thresholds.

The CAM rule is not applicable because the turbines are not subject to an emission limit and the turbines do not have a control device.

New Source Performance Standard (NSPS) Requirements for Storage Vessels for Petroleum Liquids in 40 CFR Part 60,are not currently applicable.

40 CFR 60.110(c)(1) specifies an applicability date of March 8, 1974. The tanks at this facility were constructed in 1971. Department records do not indicate the tanks undergoing any modifications since construction.

40 CFR Part 60, Subpart GG, New Source Performance Standard (NSPS) Requirements for Stationary Gas Turbines is not currently applicable.

40 CFR 60.330 (b) specifies an applicability date of October 3, 1977. The turbines were constructed in 1971. Department records do not indicate the turbines have been modified since construction.

40 CFR 72.1 Acid Rain Program General Provisions

9 VAC 5 Chapter 40 Existing Stationary Sources

Article 37 (Rule 4-37) Emission Standards For Petroleum Liquid Storage and Transfer Operations.

The startup, shut down, and malfunction opacity exclusion listed in 9 VAC 5-40-20 A 3 cannot be included in any Title V permit. This portion of the regulation is not part of the federally approved state implementation plan. The opacity standard applies to existing sources at all times including startup, shutdown and malfunction. Opacity exceedances during malfunction can be affirmatively defended provided all requirements of the affirmative defense section are met. Opacity exceedances during startup and shutdown will be reviewed with enforcement discretion using the requirements of 9 VAC 5-40-20 E, which states that “At all times, including periods of startup, shutdown and malfunction, owners shall, to the extent practical, maintain and operate and affected facility including associated air pollution control equipment in a manner consistent with air pollution control practices for minimizing emissions”.

9 VAC 5 Chapter 140 Regulation for Emissions Trading.

COMPLIANCE PLAN

At this time there are no outstanding compliance issues.

INSIGNIFICANT EMISSION UNITS

The insignificant emission units are presumed to be in compliance with all requirements of the Clean Air Act as may apply. Based on this presumption, no monitoring, recordkeeping or reporting shall be required for these emission units in accordance with 9 VAC 5-80-110.

Insignificant emission units include the following:

Emission Unit No.	Emission Unit Description	Citation[1] (9 VAC_)	Pollutant Emitted (5-80-720 B.)	Rated Capacity (5-80-720 C.)
IS-1	No. 2 Fuel Oil Tanks (NN-Tank A)	5-80-720 B.	VOC	1,500,000 gallons
IS-2	Lube Oil system	5-80-720 B.	VOC	4 @ 1,700 gallons
IS-3	Coolant/Glycol system	5-80-720 B.	Ethylene Glycol CAS # 107211	4 @ 140 gallons
IS-4	U.S.T (fuel drains/water)	5-80-720 B.	VOC	550 gallon

[1]The citation criteria for insignificant activities are as follows:
9 VAC 5-80-720 A - Listed Insignificant Activity, Not Included in Permit Application
9 VAC 5-80-720 B - Insignificant due to emission levels
9 VAC 5-80-720 C - Insignificant due to size or production rate

CONFIDENTIAL INFORMATION

The permittee did not submit a request for confidentiality. All portions of the Title V application are suitable for public review.

PUBLIC PARTICIPATION

The proposed permit will be placed on public notice in Style Weekly newspaper from May 28, 2008 to June 26, 2008. The EPA review was from May 28, 2008 to July 14, 2008.